

CLAIMS

1. A method for transporting a molecule through a mammalian barrier membrane of at least one layer of cells comprising the steps of:

ablating said membrane with a shear device comprising a sheet containing at least one opening and a shear member, where said sheet is contacted with said membrane such that a portion of said membrane is forced through said opening and ablates said portion of said membrane exposed through said opening; and

utilizing a driving force to move said molecule through said perforated membrane.

2. A method of claim 1, wherein said shear member is a shear blade.

3. A method of claim 2, wherein said portion of said membrane is forced into said opening by a pressure force.

4. A method of claim 3, wherein said pressure force is mechanical pressure.

5. A method of claim 3, wherein said pressure force is suction.

6. A method of claim 1, wherein said shear device further comprises a driving unit to move said blade.

7. A method of claim 6, wherein said driving unit is powered manually by the user of the device.

8. A method of claim 6, wherein said driving unit is powered by an electric motor.

9. A method of claim 1, wherein said membrane is selected from the group consisting of skin, buccal, vaginal, and rectal membranes.

10. A method of claim 1, wherein said membrane is human skin.

11. A method of claim 1, wherein said driving force is selected from a group consisting of iontophoresis, electro-osmosis, reverse iontophoresis, electroporation, phonophoresis, pressure gradients, and concentration gradients.

12. A method of claim 1, wherein said molecule is a pharmaceutical transported through said membrane into said mammal.

13. A method of claim 12, wherein said pharmaceutical is selected from the group consisting of polysaccharides, peptides, proteins, and polynucleotides.

14. A method of claim 12, wherein said molecule is a vaccine.

15. A method of claim 14, wherein said molecule is a vaccine against *Staphylococcus aureus*

5 16. A method of claim 1, wherein said molecule is transported from within said mammal out through said membrane.

17. A method of claim 16, wherein said molecule is glucose.

10 18. A method of claim 6, wherein said device further comprises a sensor, the feedback from said sensor modifies said driving unit.

19. A method of claim 18, wherein said sensor is selected from the group consisting of pressure sensor, conductivity sensor, impedance sensor, pH and temperature sensor.

20 20. A method of claim 1, wherein said shear member moves parallel to said shear sheet.

21. A method of claim 2, wherein said shear blade moves parallel to said shear sheet.

25 22. A method of claim 19, wherein said sensor is an impedance sensor measuring the impedance of the barrier membrane.

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23. A method of claim 22, wherein the measurements from said impedance sensor are relayed to a microprocessor.

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